Session 6B: Post-Implementation Monitoring March 19, 2008

Stormwater BMP Monitoring – Rain Gardens and Fertilizer RunoffJohn M. Barten, Director of Natural Resources Management, Three Rivers
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Rain gardens are a relatively new stormwater BMP being constructed throughout the metropolitan area of Minneapolis and St. Paul, Minnesota. The effectiveness of rain gardens in reducing runoff volume and pollutant export from impervious surfaces has not been well documented. In 2005, Three Rivers Park District initiated a monitoring program to measure the infiltration capacity and nutrient retention capacity of a rain garden located in the center of a one-acre commercial parking lot. Runoff volume entering and leaving the rain garden was measured during approximately 20 rain events from April through October, 2005. Runoff samples were collected during each event to determine inflow and outflow pollutant mass. During the monitoring period, the rain garden had a 95% and 80% removal efficiency for Total Suspended Solids and Total Phosphorus respectively.

In 2004, Minnesota implemented a phosphorus lawn fertilizer restriction to reduce phosphorus loading to lakes and rivers. Six small residential sub-watersheds were monitored from 2001 to 2006 to characterize residential runoff and track changes in phosphorus concentration and export associated with the use of phosphorus free fertilizer. The study design utilized a paired-watershed approach where three of the sub-watersheds were located in the city of Plymouth, Minnesota where the use of lawn fertilizer containing phosphorus was restricted in 1999, (treatment watersheds); the remaining three sub-watersheds were located in Maple Grove, Minnesota where phosphorus fertilizer restrictions were not initiated until 2004, (control watersheds). Study results showed a reduction of approximately 12% in phosphorus runoff from using phosphorus free fertilizer.

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